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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/955,178	09/19/2001	Kenichi Aoyagi	07481.0018	9413

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EXAMINER

THOMPSON, CAMIE S

ART UNIT PAPER NUMBER

1774

DATE MAILED: 11/07/2003

17

Please find below and/or attached an Office communication concerning this application or proceeding.

010 17

Office Action Summary

Application No.

09/955,178

Applicant(s)

AOYAGI ET AL.

Examiner

Camie S Thompson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _____ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on RCE and amendment filed August 14, 2003.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-10, 12 and 13 is/are pending in the application.
- 4a) Of the above claim(s) 11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-10, 12 and 13 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on October 6, 2003 has been entered.
2. Applicant's amendment and accompanying remarks filed August 14, 2003 have been acknowledged.
3. Examiner acknowledges amended claims 1, 3 and 5.
4. Examiner acknowledges cancelled claim 11.
5. The rejection of claims 1-2 under 35 U.S.C. 103 (a) as being unpatentable over Pearce et al., U.S. Patent Number 5,204,033 in view of Kreuger, U.S. Patent Number 5,085,928 is withdrawn due to applicant's argument.
6. The rejection of claims 3-13 under 35 U.S.C. 103(a) as being unpatentable over Pearce et al., U.S. Patent Number 5,204,033 in view of JP 04-21599 is withdrawn due to applicant's argument.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

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having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 1-2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graf, U.S.

Patent Number 5,653,331 in view of Krueger, U.S. Patent Number 5,085,928.

Graf discloses an elongate member such as a conveyor belt (transport member) that is constructed from carbon fiber reinforced plastic as per instant claim 1 (see column 3, lines 29-43). Graf does not disclose layers with a unidirectional reinforced fiber or the orientation of the fiber with respect to the transport member. Krueger teaches a fiber reinforced composite matrix (analogous art) that includes one or more layers of unidirectional fibers wherein the reinforcement direction may be $0^{\circ}/90^{\circ}/90^{\circ}/0^{\circ}$ as per instant claims 1-2 (see abstract; column 1, lines 44-55 and column 3, line 67-column 4, line 10). It would have been obvious to one of ordinary skill in the art to have unidirectional fibers in the direction of $0^{\circ}/90^{\circ}/90^{\circ}/0^{\circ}$ in order to obtain surprisingly good retention of longitudinal strength and longitudinal modulus due to the more efficient load transfer of the unidirectional reinforcement fibers as shown by Krueger in column 3, lines 49-55). The logarithmic vibration damping factor of the carbon fiber reinforced plastic is a physical property of the CFRP. Thus, the logarithmic vibration damping factor would be expected to be in the range of 0.01 to 0.05 against bending vibration.

9. Claims 310 and 12-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Graf, U.S. Patent Number 5,653,331 in view of JP 04-215599.

Graf discloses an elongate member such as a conveyor belt (transport member) that is constructed from carbon fiber reinforced plastic as per instant claim 1 (see column 3, lines 29-43). The reference does not disclose skin or core layers with fiber orientation as per instant claims 3-5. JP'599 teaches a super-lightweight sandwich panel that is comprised of a

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unidirectional carbon fiber reinforced plastic that is comprised of a four-layer structure wherein the skin layer comprises two layers that are laid in the direction of 0° and two additional layers are laid in the direction of 90° and bonded to a honeycomb core layer as per instant claims 3-5 and 13 (see abstract). It would have been obvious to one of ordinary skill in the art to have a unidirectional carbon reinforced fiber with a multi-layered structure within a skin and core configuration with specific orientation in order to increase the strength and load transfer of the transport member.

Graf does not disclose the tensile elasticity of the unidirectional fiber in the carbon fiber reinforced plastic as per instant claims 1-5. The tensile elasticity of the carbon fiber would be between 500-1000 Gpa as this is a physical property of the carbon fiber. Therefore, this feature is inherent.

The volume of the first and second layers in the skin layer and the volume of the third layer in the core layer are optimizable features as per instant claims 8-9. The amount of each layer affects the strength of the carbon fiber reinforced plastic that comprises the transport member. Discovery of an optimum values of a result effective variable involves only routine skill in the art in re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). Therefore, it would have been obvious to one of ordinary skill in the art to have the volume in the first and second layers of the skin layer be 20-100% and 0-80% respectively and the volume of the third layer in the core layer be 0-20% in order to obtain good tensile strength and elasticity of the carbon fiber reinforced prepreg.

The bending elasticity of the transport member in the longitudinal direction is 200 to 800 GPa and in the traverse direction is 30 to 100 GPa as these are the physical properties of the carbon

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fiber reinforced plastic used to make the transport member as per instant claim 6. Therefore, these features are inherent.

The expression represented in instant claim 7 describes a physical property of the transport member; thereby, making this an inherent feature.

The logarithmic vibration-damping factor of the transport member is a physical property of the transport member. Therefore, the vibration –damping factor of 0.01 to 0.05 against bending vibration is an inherent feature as provided in instant claims 3 and 5.

The specific gravity of the core layer in the carbon fiber reinforced plastic is a physical property of the prepreg. Therefore, the bulk specific gravity is within the range of 0.03 to 1.7 as this is an inherent feature as claimed in instant claim 12.

Response to Arguments

10. Applicant's arguments with respect to claims 1-10 and 12-13 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Camie S. Thompson whose telephone number is (703) 305-4488. The examiner can normally be reached on Monday through Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly, can be reached at (703) 308-0449. The fax phone numbers for the Group are (703) 872-9310 {before finals} and (703) 872-9311 {after finals}.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is

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(703) 308-0661.

CYNTHIA H. KELLY
SUPERVISORY PATENT EXAMINER
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Cynthia H. Kelly